

CLEAN VERSION OF PENDING CLAIMS

1. (Amended) A system for sensing vibration of a machine, comprising:

- a light source for directing a beam of light;
- a light receiving system for receiving at least a portion of the beam of light;
- a light modulating system for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine, the light modulating system including an obstruction modulator that varies an amount of light continuously received by the light receiving system as a function of vibration; and
- a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining vibration of the machine.

2. (Amended) The system of claim 1, [the light modulating system including the obstruction modulator adapted to obstruct the beam of light so that only the at least a portion of the beam of light is received by the light receiving system.

3. (Amended) The system of claim 1, the obstruction modulator obstructing the light beam when the machine is vibrating.

5. (Amended) The system of claim 1, the light modulating system including a housing with a first opening for receiving the light beam, a second opening for passing the at least a portion of the light beam to the light receiving system, the obstruction cantilevered support arm.

6. (Amended) The system of claim 1, the obstruction modulator being a physical component of the machine.

7. The system of claim 1, the light receiving system outputting a modulated voltage signal indicative of vibration of the machine.
8. A multiple axis vibration detection system, comprising:
a light source for directing a beam of light;
a light receiving system for receiving at least a portion of the beam of light;
a first light modulating system for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine;
a second light modulating system for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine, the second light modulating system being in series to the first light modulating system; and
a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining vibration of the machine in a plurality of axes.
9. The system of claim 8, at least one of the first light modulating system and second light modulating system including an obstruction modulator adapted to obstruct the beam of light so that only the at least a portion of the beam of light is received by the light receiving system.
10. The system of claim 9, the obstruction modulator obstructing the light beam when the machine is vibrating.
- beam when the machine is not vibrating.

18. (Amended) A system for sensing vibration of a machine, comprising:

means for directing a beam of light;

means for receiving at least a portion of the beam of light;

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means for modulating the light beam received by the means for receiving so as to correspond with vibration of the machine, the means for modulating including an obstruction means adapted to prevent passage of the light beam therethrough, the obstruction means varies an amount of light continuously received by the light receiving system as a function of vibration so that only the at least a portion of the beam of light is received by the means for receiving; and

means for processing the data received from the means for receiving to facilitate determining vibration of the machine.

21. (New) A system for sensing vibration of a machine, comprising:

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a light source for directing a beam of light;

a light receiving system for receiving at least a portion of the beam of light;

a light modulating system for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine, the light modulating system aligned along an axis extending between the light source and the light receiving system; and

a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining vibration of the machine.

22. (New) A system for sensing vibration of a machine, comprising:

- a light source for directing a beam of light;
- a light receiving system for receiving a portion of the beam of light;
- a light modulating system for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine, the light modulating system aligned along an axis extending between the light source and the light receiving system, the light modulating system including an obstruction modulator adapted to obstruct the beam of light so that only the portion of the beam of light is received by the light receiving system; and
- a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining vibration of the machine.

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23. (New) A system for sensing vibration of a machine, comprising:

- a light source for directing a beam of light;
- a light receiving system for receiving a portion of the beam of light;
- a light modulating system in a housing for modulating the light beam received by the light receiving system so as to correspond with vibration of the machine;
- an obstruction modulator secured directly to the housing and adapted to obstruct the beam of light so that only the portion of the beam of light is received by the light receiving system; and
- a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining vibration of the machine.

24. (New) The system of claim 23, the obstruction modulator secured to the interior of the housing and conforming to the shape of the housing.

25. (New) The system of claim 23, the obstruction modulator comprising an annular structure that allows the light beam to pass through the annularity.

26. (New) The system of claim 25, the light beam passing through the annularity in one direction.

27. (New) The system of claim 25, the light beam passing through the annularity in two directions.

28. (New) The system of claim 25, further comprising a light directing member for directing the light beam therethrough to the light receiving system.

29. (New) The system of claim 28, the light directing member including a reflective surface and an anti-reflective surface for directing the light beam to the light receiving system.

30. (New) The system of claim 25, further comprising a reflector for reflecting the light beam back through the obstruction modulator to the light receiving system.

31. (New) A system for sensing vibration of a machine, comprising:
a light source for directing a beam of light along a light path;
a light receiving system located in the light path to receive the light beam;
an obstruction modulator of homogenous structure located in the light path interstitial to the light source and the light receiving system for modulating the light beam received by the light receiving system, the degree of modulation corresponding to vibration of the machine, and

a processing system operatively coupled to the light receiving system, the processing system processing the data received from the light receiving system to facilitate determining the vibration of the machine.

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32. (New) The system of claim 31, the degree of modulation determined by the amount of light passing around the obstruction modulator to the light receiving system.
